USSR

BELITSKIY, I. A., SHCHERBATYUK, N. YE., KRASNOVA, L. V., FILIZOVA, L. D., TYURINA, YE. F.

"Sorption Properties of Cation-Substituted Forms of Clinoptilolite"

Novosibirsk, Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSR -- Seriya Khimicheskikh Nauk, No 1, 1973, pp 84-87

Abstract: This paper is a continuation of the study of the sorption and molecular-screen properties of high-silicon heulandite-clinoptilolite, the natural forms of which were investigated previously [I. A. Belitskiy, et al., Izv. Sib. Otd. AN SSSR, ser. khim. nauk, No 14, vyp. 6, 1971]. Just as before, monomineral ($\sim$99%) clinoptilolite from Bulgaria was used in the study:

$$(Ca_{1.26}Mg_{0.29}K_{1.58}Na_{1.34})\cdot[Al_{6.05}Si_{30.00}O_{72}]\cdot 16.59\ H_2O.$$

The study was made of the sorption properties of the clinoptilolite with respect to water vapor and methanol and six samples of cation-sensitive forms obtained by ion exchange based on clinoptilolite with lithium, sodium, potassium, rubidium, cesium and thallium ions as the "consolidated" cations.

1/2

USSR

BELITSKIY, I. A., ET AL., Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSR -- Seriya Khimicheskikh Nauk, No 1, 1973, pp 84-87

A reduction in the sorptive power was discovered going from the lithium cation form to the cesium cation form. This is connected with the reduction and degree of hydration of the cations increasing in size and also with a decrease in the free volume of the cavities.

The parameters of the microporous structure of the indicated sorbents were calculated on the basis of the Dubinin-Radushkevich theory of volumtric filling of the micropores. The lithium, sodium and potassium forms of clinoptilolite are characterized by the greatest sorption volume equal to 0.22-0.110.

2/2

USSR

UDC 632.95

FILATOV, L. N., SHCHERBATYKH, Yu. I. and BARONINA, T. G.

"Kinetics of Crystallization of Some Pesticides Disposed to Supercooling"

V sb. Khim. sredstva zashchity rast. (Chemical Protection of Plants -- collection of works), No 2, Moscow, 1972, pp 98-103 (from RZh-Khimiya, No 22, 25 Nov 73, Abstract No 22N511 by V. A. Kozlov)

Translation: Study of the kinetics of crystallization of chlorophos (I), benzophosphate (II), and coditic (III) which can occur in a supercooled metastable state. The linear rate of crystallization was determined by observing the movement of the crystal-melt interface in glass capillaries with an inner diameter of 0.8 to 1.0 mm and about 0.01 mm thick. For I the maximum rate is at 40° and it varies with the purity of the product. For 86-, 91.9-, and 97.4% I, the rate of crystallization is respectively, $1.25 \cdot 10^{-3}$, $2.15 \cdot 10^{-3}$, and $4.8 \cdot 10^{-3}$ mm/sec, for 96% II $0.19 \cdot 10^{-3}$ mm/sec, and for 98% III 1 mm/sec.

1/1

USSR UDC 632.95

YUKHTIN, N. N., FILATOV, L. N., SHCHERBATYKH, Yu. I., SMOL'CHENKO, A. I., and SHVINDLERMAN, G. S.

"Preparation of Technical Chloro-Isopropylphenyl Carbamate in Crystalline Form"

V sb. Khim. sredstva zashchity rast. (Chemical Protection of Plants -- collection of works), No 2, Moscow, 1972, pp 31-35 (from RZh-Khimiya, No 22, 25 Nov 73, Abstract No 22N570 by A. F. Grapov)

Translation: In running the reaction of m-ClC_6H_4NCO with absolute iso-PrOH in the absence of solvents, it is easy to obtain chloro-isopropylphenyl carbamate in the form of a melt from which it can be processed quite efficiently in a drum crystallizer to obtain a crystalline product. Example. 68 ml of absolute iso-PrOH at 50-65° is added a drop at a time to 100 ml of 99% m-ClC_6H_4NCO, kept for 30 min at 60-70° and the excess iso-PrOH distilled off at 90°/150-200 mm. The melt with a melting point $\geq$ 45 to 50° is then placed in the crystallizer. Yield of chloroisopropylphenyl carbamate 98.2%, melting point 35.5-36.5°. The laboratory model of the crystallizer consists of a hollow cylinder (150 mm high and 50 mm in diameter) cooled by water. Rate of crystallization 10 to 11 kg/m^2/hour.

1/1

SHCHERBAY, K.S.

JPRS 59203
6-73

3

II-12. STUDY OF THE PROCESS OF OBTAINING GALLIUM ARSENIDE CRYSTALS IN THE GaAs-Br_2 SYSTEM

[Article by M. I. Dronyuk, K. S. Shcherbay, S. S. Varshava, L'vov Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Minsk, 12-17 June, 1972, p 22]

In this paper a quantitative analysis was made of the growth conditions of gallium arsenide crystals in the bromide system. For this purpose a study was made of the equilibrium in the GaAs-Br_2 system. The experimental determination of the partial pressures of the gas components in the system was made by measuring the temperature dependence of the total pressure using the quartz zero manometer to a temperature of 1200°K. The data obtained were used to calculate the temperature dependence of the equilibrium constant of the chemical transport reaction.

A theoretical and experimental study was made of mass transport in a closed bromide system, and the relation was established between the morphology of the crystals and the crystallization conditions. The sources of contamination of the grown crystals were investigated. The crystals were inoculated with different admixtures, and a study was made of the effect of the admixtures on the morphology of the crystals and their electrophysical properties.

USSR UDC 621.78:539.219.3

NOVIKOV, B. A., KONNOVA, I. Yu., SHCHERBEDINSKIY, G. V., GOLOVANENKO, S. A., and MASLENKOV, S. B., Moscow

"Carbon Redistribution and Diffusion in Bimetals"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 72, pp 83-87

Abstract: Using C^{14} and methods of autoradiography and radiometric layer analysis the redistribution of carbon in St. 3+OKh13 bimetal was studied for two variants: without an intermediate layer and with an intermediate nickel layer. It was shown that carbon passes from the carbon steel into the stainless steel both in the process of manufacture and during all subsequent annealings. The presence of a nickel intermediate layer inhibits the passage of carbon from steel St. 3 to OKh13 and strongly varies the nature of carbon redistribution in the contact zone.

For the purpose of selecting the best bimetal cladding layers for long-time service at elevated temperatures the temperature relationships of diffusion coefficients were determined for carbon in OKh13 ferrite steel and EI943 (OKh23N28M3D3T), EI628(OKh23N28M2T), and EI432 (OKh17N13M3T) austenitic steels. Comparison of the data on these steels showed that up to 700°C

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USSR

NOVIKOV, B. A., et al., Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 72, pp 83-87

carbon penetrates EI432 steel to the greatest extent and EI943 steel to the least extent, while about 700°C carbon penetrates OKh13 steel the greatest and EI943 steel the least. 3 figures, 1 table, 2 bibliographic references.

2/2

USSR

UDC 669.1'24:620.186:539.219.3:669.789

KIDIN, I. N., SHCHERBEDINSKIY, G. V., ANDRYUSHECHKIN, V. I., and VOLKOV, V. A., Moscow Institute of Steel and Alloys

"Diffusion of Carbon in Austenite for an Fe-30% Ni Alloy During Reverse Martensite Transformation"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 1, Jan 73, pp 8-10

Abstract: The authors studied the effect of varied state of austenite structure on the diffusion of carbon in an austenitic Fe-30% Ni alloy. It was found that the decrease in the diffusion coefficients after the gamma-alpha-gamma transformation was probably associnted with the formation of a large number of defects in the austenite structure, which results in slowing down the diffusion process as a result of the interaction of carbon atoms with austenite lattice defects. Experimental data showed the energy of carbon atom-dislocation interaction amounted to 10,600±1050 cal/mole. 4 figures, 1 table, 4 bibliographic references.

1/1

1/2 025 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--SIMULTANEOUS OXIDATION OF TWO ELEMENTS FROM A THREE COMPONENT SOLID SOLUTION -U-

AUTHOR-(02)-KONDRACHENKO, L.A., SHCHERBEDINSKIY, G.V.

S

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. OBRAB. MATER. 1970, (1), 125-32

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, CHEMISTRY

TOPIC TAGS--SOLID SOLUTION, METAL OXIDATION, THERMODYNAMIC ANALYSIS, IRON ALLOY, SILICON STEEL, CARBON ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0924 STEP NO--UR/0472/70/000/001/0125/0132

CIRC ACCESSION NO--AP0116434

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0116434

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A THEORETICAL THERMODYNAMIC ANAL. WAS MADE FOR SEMI INFINITE AND FOR INFINITE MEDIA AT SUCH CONDITIONS THAT THE RATYOF CHEM. REACTIONS AT PHASE BOUNDARIES IS MUCH FASTER THAN THE DIFFUSION RATE WITHIN THE VOL. OF THE METAL. THE ORETICAL CONCLUSIONS ARE VERIFIED BY EXPTS. WITH SIMULTANEOUS OXIDN. OF SI AND C FROM THE ALLOY FE PLUS 1PERCENT SI PLUS 0.47PERCENT C INTO WHICH THE RADIOACTIVE PRIME14 C WAS INTRODUCED AS A TRACER. THE HEATING WAS IN A STREAM OF AR (2L.-HR) AND WATER VAPOR, WHEREBY THE C AND SI WERE ELIMINATED. SPECIMENS 12 TIMES 12 TIMES 10 MM, (REPRESENTING A SEMI INFINITE MEDIUM) WERE HEATED AT 950, 1050, AND 1150DEGREES, WHILE SPECIMENS 12 TIMES 12 TIMES 1 MM (REPRESENTING AN INFINITE MEDIUM) WERE HEATED AT 950DEGREES. AT EACH TEMP. 2 DURATIONS OF HEATING WERE SELECTED AND AT ALL TEMPS., ALL SPECIMENS WERE IN AUSTENITIC STATE. THEORETICAL VALUES CORRELATED WELL WITH EXPTL. ONES. ON THE BASIS OF BOTH THEORETICAL AND EXPTL. DATA, THE TEMP. DEPENDENCES OF THE D SUB11 AND D SUB22 DIFFUSION COEFFS. WERE DETD.

UNCLASSIFIED

USSR

UDC 621.777.01

GUN, G. Ya., SHCHERBEL', R. D., and GALKIN, A. M.

"Calculating the Temperature Field of a Test Piece During Precipitation on a Plastometer"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 172-177

Translation: This article deals with the question of determining the temperature field of a test piece during precipitation on a plastometer. By solving the equation of heat conductivity by numerical and analytical methods, temperature fields are obtained on the basis of the height of the test piece being precipitated at different test speeds and degrees of deformation. In order to confirm the results, an experimental investigation was made on increasing temperature when testing cylindrical specimens made of the AMG6 alloy. Four figures and five bibliographic entries.

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USSR

UDC 621.777.01

GUN, G. Ya., POLUKHIN, P. I., SHCHERBEL', R. D., and GALKIN, A. M.

"A Technique for Determining the Stress-Deformation State Under Conditions of Flat Extrusion"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 259-265

Translation: The work considers the question of determining the stress-deformation state under conditions of flat extrusion using flow theory. In determining deformation speeds and hydrostatic pressure in the deformation area, the method of electrodynamic analogies was used. Curves of deformation speeds and stresses in the deformation area were constructed on the basis of the technique developed. The work contains references to experimental confirmation of results obtained. Seven figures and four bibliographic entries.

1/1

1/2 007 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--ELECTRON DIFFRACTION STUDY OF THE STRUCTURE OF MOLECULES OF ORGANOGERMANIUM COMPOUNDS WITH EMPIRICAL FORMULA C SUB2 H SUB2 GEX SUB2
AUTHOR--VILKOV, L.V., MASTRYUKOV, V.S., SHCHERBIK, L.K., DULOVA, V.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. STRUKT. KHIM. 1970, 11(1) 3-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTRON DIFFRACTION ANALYSIS, MOLECULAR STRUCTURE, ORGANOGERMANIUM COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0312 STEP NO--UR/0192/70/011/001/0003/0007

CIRC ACCESSION NO--AP0103967

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0103967

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ELECTRON DIFFRACTION STUDY OF (C SUB2 H SUB2 GEX SUB2) SUBN (I), WHERE X EQUALS ME, CL, AND I, IN VAPOR PHASE, SHOWED THAT WHEN X EQUALS ME, N EQUALS 1 AND WHEN X EQUALS CL, N EQUALS 2. FOR X EQUALS IODINE TWO SETS OF DIFFRACTION DATA WERE OBTAINED, DEPENDING ON THE VAPORIZATION TEMP. OF THE SAMPLE, CORRESPONDING TO ELECTRON DIFFRACTION CURVES CALCD. FOR N EQUALS 1 AND N EQUALS 2, RESP. A 3 MEMBERED RING STRUCTURE II IS FOUND FOR I, N EQUALS 1 AND A 6 MEMBERED RING STRUCTURE III IS FOUND FOR I, N EQUALS 2. THE PARAMETERS DETD. BY ASSUMING RING MODELS II OR III ARE GIVEN. THE CONTROVERSY CONCERNING THE STRUCTURE OF I IS NOT FULLY SOLVED AND NEEDS FURTHER INVESTIGATION.

UNCLASSIFIED

USSR UDC 621.396.6-181.5

BELOUS, N. V., [illegible], A. S., PAVLENKO, G. I., POPOV, V. I., CHUGAYEV, V. N., SHOUTOVIK, V. K.

"On the Properties of Conductive Elements of Thin-Film Microcircuits Made by Vaporization of Aluminum, Nickel, Copper and Copper-Based Alloy"

Elektron. tekhnika. Nauch.-tekhn. sb. Mikroelektronika (Electronic Technology. Scientific and Technical Collection. Microelectronics), 1971, vyp. 1(27), pp 101-109 (from RZh-Radiotekhnika, No 8, Aug 71, Abstract No 8V277)

Translation: The authors studied the electrical, structural, adhesion and other properties of films made by vacuum deposition of aluminum, nickel, copper and an alloy of 94.5% Cu, 5% Ni and 0.5% Mn. It is shown that alloying copper with elements having a vapor pressure which differs markedly from that of the base of the alloy enables an appreciable improvement of the required properties of the films without any pronounced adverse effect on their conductivity. Resumé.

1/1

1/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--CALCULATING THE THERMAL EFFECT OF PLASTIC DEFORMATION IN HIGH VELOCITY TESTS -U-

AUTHOR-(04)-POLUKHIN, P.I., GUN, G.YA., SHCHERBIL, R.D., GALKIN, A.M.

COUNTRY OF INFO--USSR

SOURCE--IZVEST. AKAD. NAUK SSSR, METALLY, MAR.-APR. 1970 (2), 171-175

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--PLASTIC DEFORMATION, THERMAL EFFECT, ALUMINUM ALLOY, MATHEMATIC EXPRESSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1163 STEP NO--UR/0370/70/000/002/0171/0175

CIRC ACCESSION NO--AP0130191

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130191

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMAL EFFECTS RESULTING FROM HIGH SPEED PLASTIC DEFORMATION (UPSETTING) OF CYLINDRICAL METAL PARTS ARE DISCUSSED THEORETICALLY. THE TEMP. DISTRIBUTION IN SUCH SAMPLES DIFFERS ONLY SLIGHTLY FROM THAT ASSOCIATED WITH ADIABATIC DEFORMATION. FOR LOW DEFORMATION VELOCITIES THE TEMP. FIELD IS NONUNIFORM. NUMERICAL SOLUTION OF THE EQUATIONS GOVERNING THESE CHANGES TENDS TO MAKE THE SAMPLE TEMP., IN GENERAL, TOO HIGH. IN THE CASE OF THE COMPRESSION OF AL ALLOYS, IN PARTICULAR, THE THERMAL EFFECTS MAY GIVE A FALSE IMPRESSION OF THE DEFORMATION RESISTANCE.

UNCLASSIFIED

APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910019-5"

1/2 015 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--ELASTIC SCATTERING OF PROTONS ON NUCLEI OF AVERAGE ATOMIC WEIGHT -U-

AUTHOR-(03)-PROKOPENKO, V.S., TOKAREVSKIY, V.V., SHCHERBIN, V.N.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(1), 126-35

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--PROTON SCATTERING, ELASTIC SCATTERING, DIFFERENTIAL CROSS SECTION, COULOMB INTERACTION, ANGULAR DISTRIBUTION, ZINC ISOTOPE, COPPER ISOTOPE, NICKEL ISOTOPE, IRON ISOTOPE, COBALT ISOTOPE, CHROMIUM ISOTOPE, VANADIUM ISOTOPE, TITANIUM ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0239 STEP NO--UR/0048/70/034/001/0126/0135

CIRC ACCESSION NO--AP0105315

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0105315

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE BEAM OF 6.9-MEV P ACCELERATED IN A CYCLOTRON WAS FOCUSED BY A QUADRUPOLE LENS TO THE SCATTERING CHAMBERL. TARGETS WERE FREE LAYERS ENRICHED BY THE CORRESPONDING ISOTOPE. THE DIFFERENTIAL CROSS SECTION OF ELASTIC SCATTERING IN UNITS SIGMA-SIGMA SUBR (SIGMA IS DETD. EXPTL., SIGMA SUBR IS THE COULOMB CROSS SECTION) AS A FUNCTION OF THE ANGLE THETA IS GRAPHICALLY REPRESENTED FOR THE FOLLOWING NUCLEI: PRIME45 SC, PRIME46 TI, PRIME48 TI, PRIME49 TI, PRIME50 TI, PRIME51 V, PRIME50 CR, PRIME52 CR, PRIME56 FE, PRIME58 FE, PRIME59 CO, PRIME58 NI, PRIME60 NI, PRIME62 NI, PRIME64 NI, PRIME63 CU, PRIME65 CU, PRIME64 ZN, PRIME66 ZN, PRIME67 ZN, PRIME70 ZN. AT ANGLES THETA SUBK SMALLER THAN 40DEGREES THE ELEC. INTERACTION PREDOMINATES AND, THEREFORE, SIGMA-SIGMA SUBR IS CLOSE TO 1. AT ANGLES 40-80DEGREES A SEVERE DECREASE IN DIFFERENTIAL CROSS SECTIONS OCCURS WHICH IS APPROX. THE SAME FOR ALL NUCLEI. IF THE ANGLE OF SCATTERING IS SIMILAR TO 80DEGREES ALL CURVES HAVE A DEEP MIN. THE GREATEST DIFFERENCES IN CROSS SECTIONS ARE OBSD. AT ANGLES THETA LARGER OR EQUAL TO 90DEGREES. AN ANAL. OF ALL EXPTL. DATA IN THE FRAME OF THE OPTICAL MODEL WAS PERFORMED. BY ASSUMING THAT AT P ENERGY OF 6.9 MEV THE ABSORPTION OCCURS MAINLY IN THE NUCLEAR SURFACE THE COMPLEX POTENTIAL WITH 6 PARAMETERS WAS CHOSEN. IT IS CONCLUDED THAT THE (PN) CHANNEL EXHIBITS THE MOST SUBSTANTIAL INFLUENCE ON THE DEPTH OF THE REAL PART OF THE POTENTIAL.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--(P,P') REACTIONS ON SOME TITANIUM AND CHROMIUM ISOTOPES -U-

AUTHOR-(05)-ALEKSEYEV, V.V., POLYANSKIY, V.N., TERENTSKIY, K.O.,
TOKAREVSKIY, V.V., SHCHERBIN, V.N.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(1), 194-200

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--TITANIUM ISOTOPE, CHROMIUM ISOTOPE, DIFFERENTIAL CROSS SECTION, EXCITED NUCLEUS, DEUTERON BOMBARDMENT, PROTON SCATTERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1938/0275 STEP NO--UR/0048/70/034/001/0194/0200

CIRC ACCESSION NO--AP0105349

UNCLASSIFIED

2/2 -- 020 UNCLASSIFIED PROCESSING DATE--16OCT70
IRC ACCESSION NO--AP0105349
BSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE (D,P) REACTION WAS STUDIED FOR ENRICHED ISOTOPES OF PRIME48 TI(97.8PERCENT), PRIME49 TI(72.5PERCENT), PRIME50 CR(90.0PERCENT), AND PRIME52 CR(83.7PERCENT) AT A D ENERGY OF 13.6 MEV. THE DIFFERENTIAL CROSS SECTIONS ARE MEASURED FOR TRANSITIONS TO THE GROUND, AND TO THE 1ST EXCITED STATE. THEORETICAL PREDICTIONS ARE COMPARED WITH THE EXPTL. DATA. FACILITY: KIEV. GOS. UNIV. IM. SHEVCHENKO, KIEV, USSR.

ENGINEERING
Aeronautical and Space

USSR

UDC: 531.3; 629.735.45

GANIYEV, R.F. and SHCHERBINA, A.A., Kiev

"Helicopter Stability and Nonlinear Vibrations"

Kiev, Prikladnaya Mekhanika, Vol 9, Vyp 2, Feb 73, pp 42-52

Abstract: The helicopter on the ground is represented by a mathematical model consisting of a solid body on elastic supports. The hydropneumatic suspension is represented by a system of nonlinear springs. The solid body has six degrees of freedom. Two systems of coordinates are used for the analysis, one set of axis is fixed in space, the other is fixed relative to the solid body. It is assumed that the helicopter has two planes of symmetry. The analysis shows that the loss of stability may occur, it is necessary to tune the system out of resonance with the propeller speed. A diagram shows five singular points corresponding to cyclic motions. The case of nonsymmetric suspension is also considered.

USSR

UDC 539.3

YAROSHENKO, V. A., SHCHERBINA, A. V.

"Study of the Stress State of a Plate With Two Square Openings Reinforced By Continuous and Discontinuous Rings"

Tr. Nikolayev. korablestroit. in-ta (Works of Nikolayev Shipbuilding Institute), 1971, No. 50, pp 76-82 (from RZh-Mekhanika, No 3, Mar 72, Abstract No 3V86)

Translation: The problem is solved theoretically for an infinite plate with two square openings by the complex potential method of Kolosov and Muskhelishvili and theoretically by the photoelasticity method for plates of finite thickness. The results of studies to determine the maximum coefficient of stress concentration σ_0/q, where q is the tension load, at the reinforced square cuts as a function of the width of the plate, the radius of curvature of the angles of the opening, the width and height of the reinforced rings, and the distance between cuts are given in the form of graphs, empirical formulas and nomograms. This results are valid both for continuous reinforcement of the contours of the square cuts and for partial reinforcement, when the particular rings reinforce only the region of the cuts with tensile stresses. 8 ref. Authors' abstract.

1/1

USSR

UDC 621.327.534.3:62-752.3:535.231.4

BRODSKIY, YU. D., VALUYSKIY, P. G., SHCHERBINA, D. M.

"Radiation Stabilizer for High-Pressure Xenon Tubes"

Tr. metrol. in-tov SSSR (Works of the Metrology Institutes of the USSR), 1971, No. 110(170), pp 101-107 (from Referativnyy Zhurnal, Metrologiya i izmeritel'naya tekhnika, No 11, Nov 71, Abstract No 11.32.1928)

Translation: A radiation stabilizer for ultrahigh pressure dc xenon arc tubes is described that consists of a multiphase rectifier, a reference light source, a comparison circuit, and a tube current regulator connected in parallel to a ballast resistance. The stabilizer provides a constant operating regime with an accuracy of at least 0.5% under a change in the supply voltage in the range ±10%. The time constant of the stabilizer is no more than 0.15 sec. 2 ill., 2 ref.

1/1

USSR

UDC 535

SHCHERBINA, D. M.

"The Question of the Accuracy of Measurements of the Degree of Blackness of High-Temperature Materials in Reverberatory Furnaces"

V sb. Teplofiz. svoystva tverd. veshchestv. (Thermophysical Properties of Solids -- Collection of Works), Moscow, "Nauka", 1971, pp 121-122 (from RZh-Fizika, No 7, Jul 71, Abstract No 7D964)

Translation: The widely used method of T. S. Laslo contains a systematic error. It is shown that the correct result can be obtained in two cases: when the angles of incidence are 0-90° and measurements of the reflection are 0-10° or when the angles of incidence are 0-10° and the measurements of the reflection are 0-90°. The error from temperature modulation of the sample is evaluated. Authors abstract.

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USSR UDC 535

SHCHERBINA, D. M.

"Determining the Reflective Capacity of Materials on the Basis of the Reflection Indicatrix Over a Wide Temperature Range"

V sb. Teplofiz. svoystva tverd. veshchestv. (Thermophysical Properties of Solids -- Collection of Works), Moscow, "Nauka", 1971, pp112-116 (from RZh-Fizika, No 7, Jul 71, Abstract No 7D961)

Translation: The proposed method was based on obtaining the asymmetric reflection index of capture in measurements of all angles of reflection. Samples are heated from the surface by radiant energy. The limits of applicability of the method, which are determined by photon noises of the background, were investigated. The conclusions are verified by experiment. Authors abstract.

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USSR UDC 662.997:62-52

SHCHERBINA, D. M., KHIMCHENKO, V. P.

"Tracking System for Solar Furnace"

Tr. Khar'kov, NII metrol. (Works of Khar'kov Scientific Research Institute of Metrology)Moscow, 1970, pp 27-33 (from Referativnyy Zhurnal-Teploenergetika, No 6, June 72, Abstract No 6G122)

Abstract: Tracking system with light modulation by means of a rotary sheared diaphragm, serves for automatic retention of the solar image at the main focus of an automatic reflector. The diaphragm is rotated by a synchronous motor at 3000 rpm, while the 50 Hz modulation frequency is rigorously synchronous with the network frequency. A light cell with blocking layer was used as a photoreceiver. Operating conditions were determined ensuring the motion of the system even when clouds are passing in the field of vision of the long focused objective, and that there is no jerk when the sun is uncovered. The lengthy tracking system ensures the day tracking with an error of less than 3'. 4 figures, 2 references.
1/1

USSR UDC 535.89:621.385.127.8:621.3.083.342

SHCHERBINA, D. M., KHIMCHENKO, V. P., VALUYSKIY, P. G.

"A Xenon Lamp as a Point Source"

Tr. Khar'kov NII Metrol. [Works of Khar'kov Scientific Research Institute for Metrology], Moscow, 1970, pp 34-38, (Translated from Referativnyy Zhurnal, Metrologiya i Izmeritel'naya Tekhnika, 1972, No 5, Abstract No 5.32.1480).

Translation: Xenon lamps are made in the form of tubular high pressure lamps (type VD-T) with a long arc (125-175 mm) and spherical superhigh pressure lamps (type SVD) with a short arc (1.5-5.0 mm). The former have a brightness of 0.2 ksb and a light output of 35 l/w, the power of water cooled (VD-T-V) lamps reaches 10 kw, while the latter have a brightness of about 60 ksb, a light output on the order of 40 l/w, and powers of various types varying from 200 w to 5 kw (the most powerful lamps are water cooled, their brightness reaching 200 ksb). Type VD lamps, due to their high surface and comparatively low brightness, can be used for illumination. Type SVD lamps represent a valuable, near-point light source, with spectrum and brightness similar to that of the sun.

1/1

UDC 532.516

USSR

TEMKINA, V. S., SHCHERBINA, G. V.

"Laminar Flow of a Viscous Incompressible Liquid in a Porous Pipe With Uniform Pumping"

Tr. Fiz.-tekhn. in-t nizk. temperatur AN USSR (Works of the Physicotechnical Institute of Low Temperatures of the Academy of Sciences UkrSSR), 1970, No. 1, pp 127-138 (from RZh-Mekhanika, No 12, Dec 71, Abstract No 12B1046)

Translation: The equation of flow of a viscous incompressible liquid in a porous pipe with uniform pumping is discussed. The equation was obtained by Berman and was investigated by various authors. It is shown that at small pumping velocities λ there exists a positive solution $f(r, \lambda)$ which gives a unique branch of solutions bounded for $\lambda \to 0$. The problem is then investigated numerically and it is shown that the positive solution is unique only for $\lambda \leq \lambda_0$, in the interval (λ_0, λ_1) there are no positive solutions, and for $\lambda \geq \lambda_1$ this solution is nonunique. In addition, for $\lambda \to 0$ there exists one more branch of solutions (with reverse flow), but then the value of the velocity for $\lambda \to 0$ rises without limit. Authors' abstract.

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USSR

UDC: 621.317.4:621.318.134

FOMIN, A. Ye., LIPATOV, P. V., SHCHERBINA, P. L., PRISADA, V. M.

"Multidimensional Statistical Analysis of the Pulse Parameters of Ferrite Cores"

Elektron. tekhnika. Nauchno-tekhn. sb. Ferrit. tekhn. (Electronic Technology. Scientific and Technical Collection. Ferrite Technology), 1970, vyp. 3(25), pp 66-72 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A249)

Translation: The authors consider some aspects of multidimensional studies of the pulse parameters of ferrite cores -- amplitude of readout signals, time for magnetic reversal, and the rise time to maximum of the readout signals. A description is given of a measurement complex for these studies which consists of an AI-4096 analyzer, a U-700M automatic device for quality control of ferrite cores, and input matching devices. Measurement data are given as well as the results of computer processing of these data. It is emphasized that such studies are highly important for evaluating the quality of batches of ferrite cores, and for the development of controlled ferrite technology. Resumé.

1/1

L/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--THERMODYNAMIC PARAMETERS OF THE DISSOLUTION OF 2,5,DIMETHOXYTETRAHYDROFURAN AND 2,3,DICHLOROBUTANE ISOMERS STUDIED BY

AUTHOR-(03)-SHCHERBINA, T.M., BONDAREV, V.B., VITT, S.V.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (4), 951-3

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--THERMODYNAMIC CHARACTERISTIC, FURAN, CHLORINATED ALIPHATIC COMPOUND, BUTANE, ISOMER, GAS CHROMATOGRAPHY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0989 STEP NO--UR/0062/70/000/004/0951/0953

CIRC ACCESSION NO--AP0138017

UNCLASSIFIED

2/2 022 UNCLASSIFIED

CIRC ACCESSION NO--AP0138017 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EXCESS THERMODYNAMIC PARAMETERS WERE TABULATED FOR THE PROCESS OF DISSOLUTION OF ISOMERS OF 2,5 DIMETHOXYTETRAHYDROFURAN AND 2,3 DICHLOROBUTANE ON A VARIETY OF CHROMATOGRAPHIC IMMOBILE PHASE COMPNS. FROM THE DATA ON ENTHALPY AND FREE ENERGY OF THE PROCESSES, IT WAS SUGGESTED THAT THE SPECIFICITY OF A PHASE IN VAPOR CHROMATOG. BE DEFINED OR EVALUATED BY THE DIFFERENCES IN THE CHANGE OF FREE ENERGY DELTA DELTA F IN THE INTERACTION OF THE ISOMERIC FORMS OF THE SUBSTRATE. THE VAPOR D. OF THE ISOMERS OF THE SUBSTRATE WAS DETD. DIRECTLY BY INTRODUCTION OF A SPECIMEN OF THE SUBSTANCE INTO A THERMOSTATED GLASS TUBE FILLED WITH GLASS SPHERES SO THAT THE CARRIER GAS WAS SATD. BY THE VAPOR OF THE SUBSTRATE, THEN TRANSFERRED INTO THE CALIBRATED VOLUME WHICH WAS MAINTAINED AT A SOMEWHAT HIGHER TEMP. BY TURNING THE VALVE THE SUBSTANCE WAS TRANSFERRED INTO THE CHROMATOGRAPHIC COLUMN AND THE VAPOR D. DETD. FROM PEAK AREA ON THE PLOT OF ITS EXIT FROM THE COLUMN. FACILITY: INST. ELEMENTOORG. SOEDIN, MOSCOW, USSR.

UNCLASSIFIED

USSR UDC 621.373.431.2(088.8)

KABLOV, G. P., KOCHERGIN, O. K., SHCHERBINA, V. P.

"Blocking Generator"

USSR Author's Certificate No 272355, Filed 15 Apr 68, Published 9 Sep 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4G229P)

Translation: A transistorized blocking generator is proposed, which contains a pulse bridge element to one arm of which the transformer winding of the blocking generator is connected. In order to regulate the pulse repetition period within broad limits, the bridge element is connected via a separating capacitor to the collector of the transistor and via a resistor, to the control voltage source.

SHCHERBINA, V. O.

AA0045988

UR 0482

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Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

244507 MINIATURE VARIABLE CAPACITOR has stator plates which are covered on both sides by a solid dielectric film, except at the end where the connections are made. The films protrude over the metal plates where the rotor plates enter and are joined to form a leading edge. To eliminate electrostatic noise and reduce the absorption of moisture, a lubricant in the form of a molecular layer of polymethyl siloxane is applied to the surfaces of friction between the plates.

10.6.66 as 1081828/26-9. M.M.BELAYEV et al.(7.10.69) Bul 16/28.5.69. Class 21g. Int.Cl. H 01 g.

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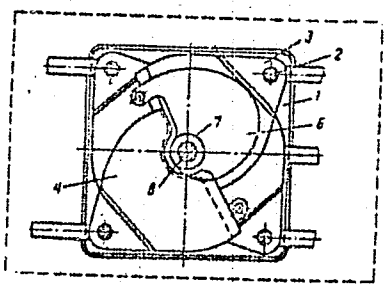
4

19790394

AA0046988

AUTHORS: Belyayev, M. M.; Vinogradova, T. F.; Goncharov, I. K.; Zaryutin, V. N.; Shcherbina, V. O.; Fridman, Ye. I.; El'kun, N. Ya.; Yerastova, V. I.



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19790395

USSR

UDC 621.762.4:621.77.2

PAVLOV, V. A., ZHIVOV, L. I., SHCHERBINA, V. V., LYASHENKO, A. P., PETRYKINA, R. YA., LITVIN, Zaporozh'ye Machine Building Institute imeni V. Ya. Chubar'

"Hot Extrusion of Powdered Titanium"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 73, pp 15-19

Abstract: Hot extrusion of titanium powder was studied using a 1600 ton-force crank press. The raw powder, sintered billets, and, for comparison, sheet titanium were extruded. Both open and closed dies were used. It was observed that there was a decrease in grain size with a simultaneous increase of their total surface area, promoting intensification of intergranular diffusion which occurs with a significant increase in the diffusion rate, caused by the high specific force and temperature (950°C). Mechanical properties of briquets extruded at 950°C and heat treated by annealing at 750°C for three hours in a vacuum of $2 \cdot 10^{-4}$ mm Hg are compared with briquets which were vacuum sintered at 1200°C for three hours prior to extruding and given the same heat treatment as stated above after extruding. Density and mechanical properties of the vacuum sintered briquets is slightly higher than the non-vacuum sintered briquets but not enough to warrant the additional

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USSR

PAVLOV, V. A., et al., Poroshkovaya Metallurgiya, No 8, Aug 73, pp 15-19

cost of vacuum sintering. The introduction of extruded powder-titanium parts and titanium-alloy powder parts to replace cast parts will result in increased savings by using a less expensive raw material, shortening of intermediate operations, increased die strength, increased labor productivity, and decreased metal losses. Three figures, one table, three bibliographic references.

2/2

SHCHERBINA V.V.

Geology + mineralogy

INTERNATIONAL GEOCHEMISTS MEETING

(Congress in Moscow)

[Article by Doctor of Geological and Mineralogical Sciences V. V. Shcherbina]

Moscow, Vestnik Akademii Nauk SSSR, Russian, No 11, November 1971, pp 89-93]

The first international congress devoted to a study of geochemical processes was held in Moscow on 20-25 July. Organized by the Academy of Sciences USSR with the cooperation of UNESCO, this congress drew the attention of the world geology community -- the approximately 1700 conferees represented 25 different nations.

The importance of holding a congress on problems of geochemistry is due to the fact that in recent years a great number of geochemical studies have been limited to chemical analysis of rocks and minerals (content of various elements, usually rare) or to description of the distribution of chemical elements in rocks or minerals; at best a chemical (or crystallo-chemical) interpretation was given to this distribution, and at worst efforts were limited to processing analysis results employing methods of mathematical statistics without any genetic conclusions. In addition, geochemical research has frequently dealt with quite narrow problems or commonly-known processes, with indication of their distinctive features in a given geologic period, while internal causes, chemistry of processes or that which is called the "physical significance of the phenomenon" were usually ignored.

In addition to recent years, as a result of reproducing natural processes under laboratory conditions, vast experimental material has been accumulated -- data from precise measurements of temperature, pressure and other physicochemical parameters of such processes. A great number of determinations of these parameters have been made under natural conditions, with a major contribution coming from a study of gas-liquid inclusions in the crystals of endogenic minerals (thermometry). Isotope studies have opened up the possibility of explaining aspects of geochemical processes which cannot be approached with ordinary chemical methods (for example, the prehistory of the chemical elements of a bed or determination of

USSR

UDC: 621.77.2

ZHIVOV, L. I., PAVLOV, V. A., SHCHERBINA, V. V., KOLESNIK, F. I. and MAKOGON, V. N., Zaporozh'ye Machine Building Institute

"Conditions for Hot Extrusion of Rods From Cermet Titanium"

Kiev, Poroshkovaya metallurgiya, No 11, Nov 71, pp 16-21

Abstract: Rods and shapes of intricate cross sections with a density close to monolithic metal may be produced from pre-compressed titanium powder briquettes with the use of appropriate equipment and the knowledge of the power energy parameters of hot extrusion (including force and work of deformation). Characteristic of hot forming of powdered metals and specifically of titanium powder is the fact that the density of the briquette in the first (nonstationary) phase of extrusion is lower than that of monolithic metal. In the second, quasi-stationary region, the densities of both the cake and the finished product are commensurate and approach that of monolithic metal. The stress-deformation relationship characteristic of a solid metal may be applied with reasonable accuracy to powdered materials. Considered here is the hot extrusion of pure titanium

USSR
ZHIVOV, L. I., et al, Poroshkovaya metallurgiya, No 11, Nov 71, pp 16-21

powders and those alloyed with tungsten carbide (up to 30%). Use is made of correction coefficients for crank press tests to correlate the data on stresses and deformations by simple mathematical relationships. A nomograph is proposed for rapid determination of both specific and over-all stresses of extrusion of cermet materials. (5 illustrations, 1 table, 2 bibliographic references).

2/2

1/2 012 UNCLASSIFIED PROCESSING DATE--23OCT7(

TITLE--GEOCHEMISTRY OF RARE ELEMENTS -U-

AUTHOR--SHCHERBINA, V.V.

COUNTRY OF INFO--USSR

SOURCE--GEOKHIMIYA 1970, (4), 439-45

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--GEOCHEMISTRY, RARE METAL, BIBLIOGRAPHY, SULFIDE, OXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1522 STEP NO--UR/0007/70/000/004/0439/0445

CIRC ACCESSION NO--AP0120303

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--23OCT7

CIRC ACCESSION NO--AP0120303

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW IS PRESENTED WITH 12 REFS. IT INCLUDES THE DEFINITION OF RARE ELEMENTS, FACTORS AFFECTING THE CONCN. OF RARE AND SCATTERED ELEMENTS, POS. AND NEG. EFFECTS OF FOREIGN ELEMENTS ON THE PRESENCE OF RARE ELEMENTS, AND EFFECT OF PH OF THE MEDIUM AND DEFREE OF ITS CARBONATIZATION. THE ROLE OF PRESSURE, REDOX PROCESSES, AND OXIDE SULFIDE EQUIL. ON THE CONCN. OF RARE ELEMENT WAS DISCUSSED. FACILITY: V. I. VERNADSKII INST. GEOCHEM. ANAL. CHEM., MOSCOW, USSR.

UNCLASSIFIED

USSR

SERGOVANTSEV, V. T., GERASIMOV, S. P., and SHCHERBINA, V. Ye.

UDC: 621-398

"Device for Reception and Transmission of Signals Along a Tubular Conducting Channel"

USSR Author's Certificate No 278819, filed 28 Nov 68, published 20 Nov 70 (from RZh-Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 12, 1971, Abstract No 12A227P)

Translation: A device is patented for the reception and transmission of signals along a tubular conducting channel containing a filter whose input is connected to the tubular conductor; an amplifier; a controller of signal repetition periods; a recorder; an oscillator; AND, OR elements; an "inhibit"; storage devices; a cutoff circuit; controlling and modulating flip-flops; a modulator; and switches. For the purpose of simplifying and improving the reliability of operation of the device, the outputs of the switches are connected to the inputs of the OR element, the output of that element is tied to the input of the controlling flip-flop, and the output of the latter is connected to the input of the "inhibit" element and through the AND element to the recorder input and the first inputs of the cutoff circuit and controller of the signal repetition

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USSR

SERGOVANTSEV, V.T., et al, USSR Author's Certificate No 278819

periods; the second inputs of the cutoff circuit and the controller are connected to the recorder output, and the output of the controller is connected to the second input of the controlling flip-flop; the outputs of the recorder are then connected through the proper switch contacts to the input of the modulating flip-flop.

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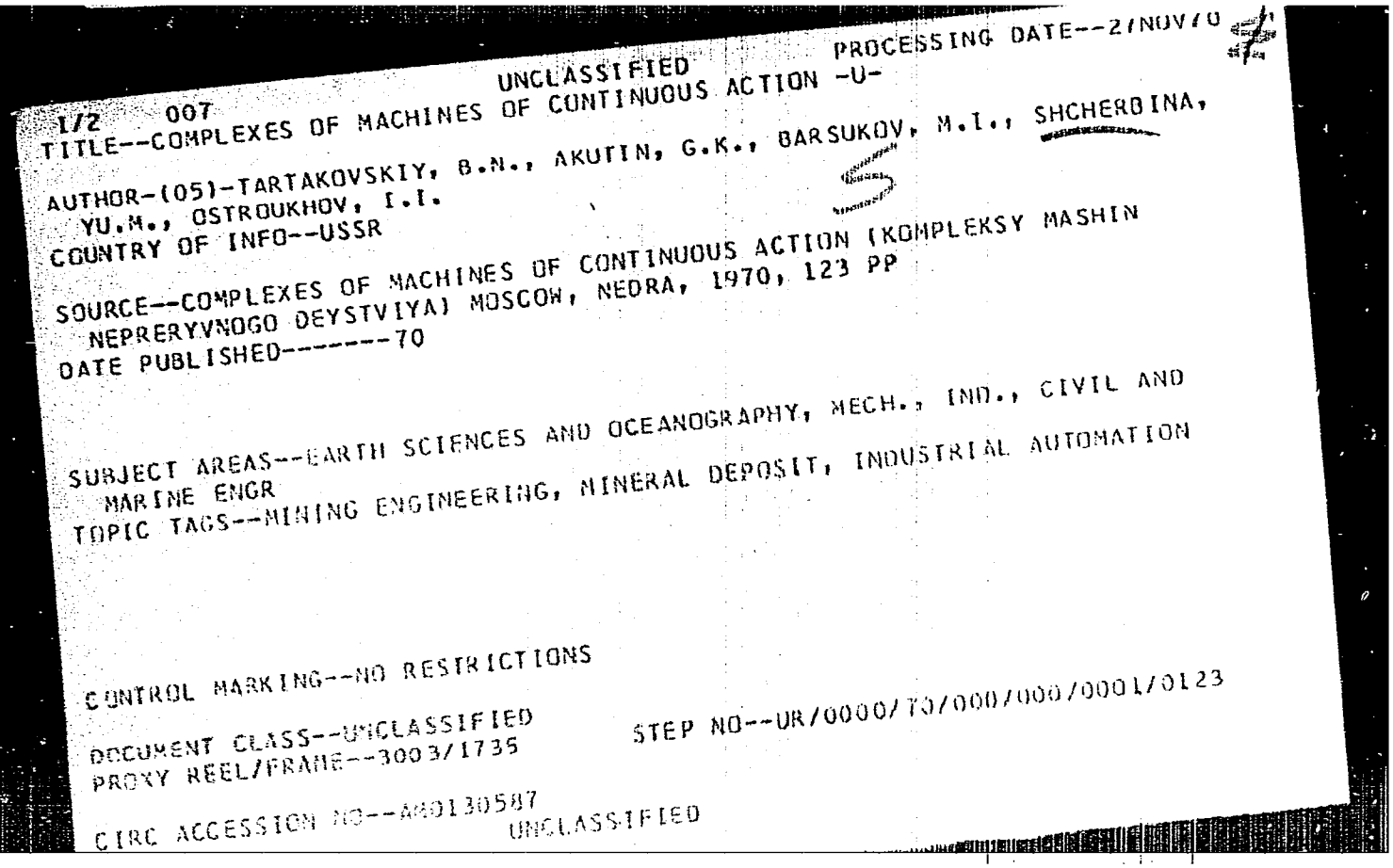

UNCLASSIFIED PROCESSING DATE--21NOV70

1/2 007

TITLE--COMPLEXES OF MACHINES OF CONTINUOUS ACTION -U-

AUTHOR-(05)-TARTAKOVSKIY, B.N., AKUTIN, G.K., BARSUKOV, M.I., SHCHERBINA, YU.M., OSTROUKHOV, I.I.

COUNTRY OF INFO--USSR

SOURCE--COMPLEXES OF MACHINES OF CONTINUOUS ACTION (KOMPLEKSY MASHIN NEPRERYVNOGO DEYSTVIYA) MOSCOW, NEDRA, 1970, 123 PP

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--MINING ENGINEERING, MINERAL DEPOSIT, INDUSTRIAL AUTOMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0000/70/000/000/0001/0123

PROXY REEL/FRAME--3003/1735

CIRC ACCESSION NO--AM0130587

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AM0130587

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: PREFACE 5. CHAPTER I. MECHANIZATION OF STRIPPING OPERATIONS IN OPEN CUT MINES 12. II. MECHANIZATION OF MINE CONSTRUCTION OPERATIONS IN OPEN CUT MINES 36. USE OF CONTINUOUS OPERATION TECHNIQUES 70. CONCLUSION 125. BIBLIOGRAPHY 126. THE BOOK DEALS WITH BASIC MOST TYPICAL FLOW SHEETS IN MECHANIZATION OF STRIPPING AND MINE CONSTRUCTION OPERATIONS IN OPEN CUT MINES BY MEANS OF COMPELXES OF CONTINUOUS OPERATION MACHINES, AS WELL AS FUNDAMENTAL PRINCIPLES IN AUTOMATION OF THESE COMPLEXES. THE BOOK WAS WRITTEN FOR A WIDE CIRCLE OF ENGINEERING TECHNICAL PERSONNEL OF MINING ENTERPRISES, DESIGN AND SCIENTIFIC RESEARCH ORGANIZATONS; IT CAN BE USEFUL ALSO TO COLLEGE STUDENTS SPECIALIZING IN THE FIELD OF OPEN CUT MINING DEPOSITS.

UNCLASSIFIED

SHCHERBININ, A.A.

SPIS 57208
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3

XII-5. MECHANISMS OF THE PROCESS OF LOCAL PICKLING OF SILICON SUBSTRATES MASKED WITH SILICON OXIDE

[Article by A. A. Shcherbinin, K. -G. M. Shvarts, Yu. D. Chistyakov, Moscow; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 108]

A study was made of the process of local pickling of silicon substrates masked with silicon oxide in a mixture of hydrogen chloride and hydrogen. It was found that the shape of the depressions as a result of the etching depends on the temperature and concentration of the hydrogen chloride and is determined by two simultaneously occurring processes: between the silicon substrate free of the oxide mask and the H_2-HCl mixture and between the substrate and the silicon oxide film in the presence of hydrogen.

The mechanism of local etching of the silicon substrates masked by an oxide film is proposed, and the possible forms of the depressions are explained on the basis of this.

The quantitative relation of the normal and tangential etching rates of the depressions found.

USSR

UDC: 621.373:530.145.6

SHCHERBININ, A. F.

"Submillimeter Wavelength Masers Based on H_2O, D_2O and H_2S Molecular Beams"

Dokl. Nauchno-tekhn. seminara "Metrologiya v radioelektronike". Tezisy. Ch. 2 (Reports of the Scientific and Technical Seminar on Metrology in Radio Electronics. Summaries, Part 2), Moscow, 1970, pp 33-34 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7D245)

Translation: To produce quantum frequency standards with reproducibility of at least 10^{-11}, it is proposed that molecules of ammonium and light hydrogen halides be used, specifically the transitions $1_{11} \rightarrow 0_{00}$, $1_{10} \rightarrow 1_{01}$, $2_{11} \rightarrow 2_{02}$ in H_2O and D_2O molecules, and the transitions $1_{11} \rightarrow 0_{00}$, $1_{10} \rightarrow 1_{01}$, $2_{02} \rightarrow 2_{11}$ in the H_2S molecule. The transitions $1_{11} \rightarrow 0_{00}$ and $2_{11} \rightarrow 2_{02}$ in H_2O and the transitions $1_{11} \rightarrow 0_{00}$ and $2_{20} \rightarrow 2_{11}$ in H_2S are characterized by the absence of a hyperfine structure. The width of the emission line, which is determined by beam divergence, may be reduced by using a U-shaped Fabry-Perot resonator with a diaphragm which cuts off part of the beam between the resonator arms. A. K.

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SHCHERBININ, E. V.

(1)

JPRS 60634
27 NOVEMBER 1973

THREE-DIMENSIONAL MAGNETOHYDRODYNAMIC JET

[Abstract of a Paper by E. V. Shcherbinin Given at a Magnetohydrodynamic Conference, p 63]

A study was made of the three-dimensional matched jet with an initial profile having the form of an ellipse in the transverse cross section with arbitrary halfaxes $f_0(y,z) = \exp[-(a^2y^2 + b^2z^2)]$ in a uniform transverse magnetic field B_y. The linearized system of equations is solved using a double Fourier transformation. In this case the final solution for the velocity field acquires the form

$$f = \frac{1}{2\pi ab}\int_0^{2\pi} \frac{\exp(-Nx\cos^2\theta)}{n}\left[1 - \frac{m}{\sqrt{n}}\exp\left(-\frac{m^2}{4n}\right)\operatorname{Erfi}\left(\frac{m}{2\sqrt{n}}\right)d\theta\right];$$

$$m = y\cos\theta + z\sin\theta,\quad n = \frac{\cos^2\theta}{4a^2} + \frac{\sin^2\theta}{4b^2} + x,\quad \operatorname{Erfi}(t) = \int_0^t e^{q^2}dq. \qquad (1)$$

The numerical calculation of the integral (1) demonstrated that the jet with any initial velocity distribution degenerates into a jet such that the shape of its transverse cross section acquires the form of an ellipse, the major halfaxis of which is oriented in the direction of the magnetic field, and inverse velocity zones appear in the direction perpendicular to the field (Figure 1).

For large Nx, the three-dimensional jet damps proportionally to the -3/2 power of the distance and the -1/2 power of N, that is, in the magnetic field the three-dimensional jet erodes more quickly than outside the field, but much more slowly than the two-dimensional jet, the damping of which takes place exponentially with an increase in Nx.

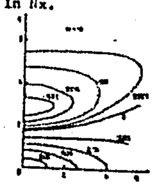

Figure 1.

10,845
CSO: 8044/0653-W

USSR

UDC 538.4

BUTSENIEKS, I. E., SLYUSAREV, N. M., SHCHERBININ, E. V.

"Turbulent Pulsations in Free Boundary Layers with Even MHD Flow in a Pipe"

Riga, Magnitnaya Gidrodinamika, No 3, Jul-Sep 72, pp 135-138.

Abstract: This work presents the results of measurement of intensity of turbulent pulsations in a flow of an electrical conducting fluid under conditions such that the heterogeneity of the velocity structure occurs at the center of the flow. The components of the electrical field were measured as the fluid flowed through a square tube with two insulators and two conducting walls in a transverse magnetic field oriented diagonally across the tube. It is demonstrated that when there are free boundary layers in the flow, an increase in the magnetic field does not laminarize the flow, but rather increases the level of turbulent pulsations.

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USSR

SHCHERBININ, E. V.

"Self-Excitation of a System with Radial Fluid Flow"

7-ye. Soveshch. po Magnit. Gidrodinamike. T. 1. [Seventh Conference on Magnetic Hydrodynamics, Vol 1 -- Collection of Works], Riga, Zinatnye Press, 1972, p 208, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 B67).

Translation: An expanding flow with a radial velocity component V_r = $= (Q/2\pi l)\ (1/r)$ induces an electric current in an azimuthal magnetic field produced by a conductor carrying current; the induced current corresponds in direction with the current in the conductor. If the induced current in the fluid is used to supply an internal solid conductor, in certain modes, self-excitation of the system is possible. The beginning of self-excitation is defined by the condition of equality of the current passing through the solid conductor to the current induced in the liquid volume. This condition, written as

USSR

SHCHERBININ, E. V., 7-ye. Soveshch. po Magnit. Gidrodinamike. T. 1, Riga, Zinatnye Press, 1972, p 208.

relates $R_m = \mu\sigma_2 Q/2\pi l$, the dimensions of the device (ratio of external radius r and internal radius r_1 of the electrodes) and the load parameter

$$k = \frac{\sigma_1}{\sigma_2}\left(1 + \frac{R_2 + R_3}{R_1}\right)^{-1}$$

in the self-excitation mode. Here σ_1 and σ_2 are the conductivities of the internal cylinder and fluid, R_1, R_2 and R_3 are the resistances of the cylinder, fluid and switching circuit respectively.

2/2

USSR

BUTSENIYEKS, I. E., SLYUSAREV, N. M., SHCHERBININ, E. V.

"MHD Turbulence in Free Boundary Layers in a Square Cube"

7-ye. Soveshch. po Magnit. Gidrodinamike. T. 1. [Seventh Conference on Magnetic Hydrodynamics, Vol 1 -- Collection of Works], Riga, Zinatnye Press, 1972, pp 37-39, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 B57).

Translation: The pulsations of the electric field components e'_1, e'_2 and e'_3 are measured as an electrically conducting fluid flows through a square tube (29×29 mm^2) with two nonconducting and two conducting (copper) walls in a transverse magnetic field oriented along diagonals of the tube, for $R = 17,200$ and $H = 190, 380, 520$, calculated on the basis of the half width of the channel.

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USSR

UDC 669.15.018.8:620.194.2

NAZAROV, A. A., SHCHERBININ, V. F.

"Effect of Cold Deformation on the Tendency of 0Kh18N10T Stainless Steel Toward Stress Corrosion Cracking"

Metallovedeniye -- V sb. (Physical Metallurgy -- collection of works), No 14, Leningrad, Sudostroyeniye Press, 1970, pp 94-100 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G617)

Translation: A study was made of the effect of cold deformation of rolled products and tension on the corrosion resistance of 0Kh18N10T steel in distilled water containing a different amount of chlorides under the conditions of constant and variable wetting of the steel surface with water. It is demonstrated that in water containing 0.02-7 mg/liter of O_2 and with a low chloride content, the strength of the cold-deformed steel differs little from the strength of austenitic steel tested over a period of 1,000 hours. There are 2 tables and 4 illustrations.

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UDC 576.895.4

USSR

SHCHERBININA, O. Kh., Institute of Zoology, Academy of Sciences Turkmen SSR

"Bird Hosts of Hyalomma plumbeum (Panz.) in Turkmenia"

Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, Seriya Biologicheskikh Nauk, No 5, 1971, pp 54-57

Abstract: In 1965-1970, birds were trapped in six regions of Turkmenia and investigated for the presence of H. plumbeum, which transmits a number of microbes pathogenic to man and animals. Of the 640 birds (representing 90 species) investigated, 11.4% were found to host the preimago stage of H. plumbeum. Though older records identified only seven species as hosts, the infection was diagnosed in 26 species, most of them collecting food on the ground.

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1/2 008 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--USE OF AMMONIA TO NEUTRALIZE WASH WATERS -U-

AUTHOR-(03)-IVANOVA, YE.S., SHCHERBININA, S.D., KAPLINA, N.YA.

COUNTRY OF INFO--USSR

SOURCE--ENERGETIK 1970, (1), 10-11

DATE PUBLISHED--------70

SUBJECT AREAS--AGRICULTURE, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--INDUSTRIAL WATER, INDUSTRIAL WASTE TREATMENT, AMMONIA, SULFATE, FERTILIZER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1696 STEP NO--UR/0091/70/000/001/0010/0011

CIRC ACCESSION NO--AP0125317

UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125317

ABSTRACT/EXTRACT--(U) GP-0- NEGATIVE 14.75, FE 5.50, V 0.35, NI 0.065, CU 0.025 G-L., AND 0.38PERCENT H SUB2 SO SUB4 WERE NEUTRALIZED WITH EXCESS NH SUB3 5.6-6.0 KG-M PRIME3 (116PERCENT OF THEORETICAL) AND YIELDED SULFATE FREE PPTS. ENRICHED IN V AND NI. THE WATER CONTG. SIMILAR TO 2PERCENT (NH SUB4)SUB2 SO SUB4 IS USEFUL IS USEFUL AS A FERTILIZER AND THE GYPSUM FREE PPT. CONTG. FE SUB2 O SUB3 69.5, V SUB2 O SUB5 7.5, NI AND CU OXIDES 2.0 AND ORG. RESIDUES 19.4PERCENT CAN BE REUSED IN METALLURGY. THE NH SUB3 PPTN. REMOVES ALL THE INORG. AND ORG. (FUEL OIL OR UNCOMBUSTED COKE) MATERIALS COMPLETELY EXCEPT FOR NI AND CU. THE 2-3PERCENT OF NI AND CU REMAINING IN SOLN. CAN BE REMOVED BY CATION EXCHANGE ON A NH SUB3 WASHED SULFONATED COAL.

UNCLASSIFIED

USSR

UDC 8.74

SHCHERBINSKAYA, A. V.

"Programs on the M-20 Computer for Constructing a System of Consumer Models in Terms of Cost"

V sb. Probl. modelir. nar. kh-va. Ch. 2 (National Economic Simulation Problems. Part 2--collection of works), Novosibirsk, 1972, pp 86-100 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V499)

Translation: Two sets of programs for the M-20 computer were written by the schemes described in the article "Definition of the Parameters of Consumption Models by the Least Squares Method." One set is designed for constructing a system of models with respect to budgets of industrial and office workers, and the second set, for kolkhoz worker budgets. Each set comprises three programs: 1) calculation of the model parameter; 2) selecting the models for each commodity; 3) calculation of the balanced table model system.

All of the programs of each set are combined for operation in the semi-automatic mode with data transmission from one program to another without printing out. The programs are executed in the M-20 instruction system in provisional addresses.

The output of the results of the operation of the first program is in the form of a printout of a series of numbers a_0', s_0'; a_1', s_1', ..., a_k^p, s_k^p on

1/2

USSR

SHCHERBINSKAYA, A. V., Probl. modelir. nar. kh-va. Ch. 2, Novosibirsk, 1972, pp 86-100

completion of the solution process for one commodity where a_k^p is the coefficient, s_k^p is its fiducial interval, k is the number of the coefficient in the equation, and p is the equation number.

The results of the calculations executed by program 2 are printed out each time after calculating one commodity. On completion of the calculation process in program 3, the numbers of the commodities and the values of the consumption variables f are printed out.

The programs operate with utilization of the ready-access memory, the MB-1 and MB-2 magnetic drums and the IS-2 standard routines: 0002-10→2; 0003-e_x; 00004-ln x; 0027-2→10.

The instruction is presented for utilization of the combined program.

2/2

USSR

UDC 51

LEYFMAN, L. YA., SHCHERBINSKAYA, A. V.

"Defining the Parameters of Consumption Models by the Least Squares Method"

V sb. Probl. modelir. nar. kh-va. Ch. 2 (Problems of Simulating the National Economy. Part 2--collection of works), Novosibirsk, 1972, pp 43-85 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V353)

No abstract

1/1

USSR UDC 621.372.8.092.22

SHCHERBITSKIY, A. N.

"Integral Equations of a Two-Dimensional Problem on the Excitation of an Impedance Cylinder of Arbitrary Form Near an Impedance Surface"

Tr. Mosk. in-ta radiotekhn., elektron. i avtomatiki (Works of the Moscow Institute of Radio Engineering, Electronics and Automation), 1972, vyp.55, pp 121-136 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B102)

Translation: Integral equations are derived for currents induced onto the surface of an impedance cylinder located near an impedance plane. The solution for the currents makes it possible to find the electromagnetic field in a random point of space. Various types of excitation are studied. First and second kind Fredholm integral equations are derived with respect to the electric and magnetic currents induced onto the cylinder surface. Original article: three illustrations and two bibliographic entries. Resume.

1/1

USSR

UDC: 621.378.32

SHCHERBOV, V. A. and LITVINOV, D. D.

"Matching Beamguide Loads"

Kiev, Izvestiya VUZ SSSR--Radioelektronika, No 9, 1972, pp 1175-1178

Abstract: A matching transformer to be used between millimeter and submillimeter wavelength devices is described in this article. The transformer, free for the most part of the deficiencies of known matching transformers, is shown in simplified form and its construction explained. Results of the experimental investigation of its parameters are presented, and recommendations are made for further improvements. The distinctive feature of the transformer is a structure made up of two rotatable conducting grids. Graphs are plotted for the coefficient of reflection at the transformer input as a function of the angle of rotation of the grids and as a function of the frequency change of the uhf signal; there are also plots of the transformer losses as a function of the coefficient of reflection of the matched load and of the ratio of the reflected and transmitted signal components as a function of the grids' rotational angle. The experiments from which this data was obtained

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USSR UDC: 621.376.32

SHCHERBOV, V. A., et al, Izvestiya VUZ SSSR--Radioelektronika, No 9, 1972, pp 1175-1178

were conducted for signals of 1.53 and 1.73 mm wavelengths.

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USSR

UDC: 621.378.32

SHCHERBOV, V. A.

"Using Polarizing Grids for Beam-Guide Matching"

Kiev, Izvestiya VUZ SSSR--Radioelektronika, No 6, 1972, pp 739-744

Abstract: The use of polarizing grids for matching in quasi-optical beam-guides is proposed in place of the two types of matching transformers now in use. One of these transformers uses dielectric films and suffers from limitations in the range of matching as well as losses in the films; the other is made up of polarizing wire grids and is subject to high loss. The new type of matching device discussed in this paper is proof against these defects, as experimental investigation has shown. The theory of the device is developed and the question of the width of its band pass discussed. A cross-sectional diagram of the structure of the matching grid is shown together with curves representing the experimental data. The experiments showed that the grid band pass is narrow, but that it can be broadened without too much difficulty by varying its dimensions.

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USSR

UDC: 621.378.32

SHCHERBOV, V. A.

"A Variable Reference Load for a Light Guide"

Kiev, Radioelektronika, Vol 15, No 7, Jul 72, pp 895-898

Abstract: The author describes a variable reference load for a light guide similar to the variable loads designed for waveguide systems. The device provides independent control of the modulus and phase of the coefficient of reflection. The principle of operation is based on variation of the coefficient of reflection of a microwave signal from a flat one-dimensional wire grid when there is a change in the angle between the direction of polarization of the radiation incident on the grid and the direction of the wires making up the grid, assuming that the grid spacing is much less than a wavelength. Depolarization of the reflected signal is prevented by using another wire grid located in front of the rotatable grid. A load of this design based on a hollow dielectric light guide is shown in the figure. Located in light guide 1 are two one-dimensional wire grids 2 and 3. The plane of the fixed grid 2 is inclined to the axis of the light guide, and the direction of the wires is prependicular to the vector of electric field strength

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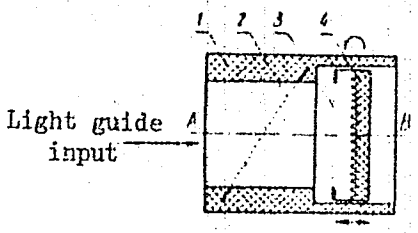
USSR

SHCHERBOV, V. A., Radioelektronika, Vol 15, No 7, Jul 72, pp 895-898

at the load input. Grid 3 is held in a rotating sleeve. This same sleeve also carries absorbing load 4. The angle of turn is calibrated, and the rotating sleeve is placed in a sliding barrel for longitudinal displacement. Tests of the device show that it can be used to advantage in balanced bridge systems for measuring reflections from various light-guide elements.



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1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--QUANTITATIVE ULTRAMICROANALYSIS OF AMINO ACIDS IN THE FORM OF THEIR DNS, DANSYL, DERIVATIVES. I. APPARATUS FOR ULTRAMICROANALYSIS OF DNS

AUTHOR-(04)-SPIVAK, V.A., ORLOV, V.M., SHCHERBUKHIN, V.V., VARSHAVSKIY, YA.M.

COUNTRY OF INFO--USSR

SOURCE--ANAL. BIOCHEM. 1970, 35(1), 227-34

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--AMINO ACID ANALYSIS, MICROCHEMICAL ANALYSIS, LUMINESCENCE, UV SPECTRUM, CHROMATOGRAPHIC SEPARATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0058 STEP NO--UK/0000/70/035/001/0227/0234

CIRC ACCESSION NO--AP0119054

UNCLASSIFIED

APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910019-5"

UNCLASSIFIED PROCESSING DATE--23OCT70

2/2 020

CIRC ACCESSION NO--AP0119054

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN APP. IS DESCRIBED THAT PERMITS DETN. OF THE RELATIVE AMTS. FO DNS AMINO ACIDS DIRECTLY IN THE THIN LAYER OF ADSORBANT AFTER CHROMATOGRAPHIC SEPN. THE METHOD OF MEASUREMENT IS BASED UPON THE ABILITY OF THE DNS AMINO ACIDS TO LUMINESCENCE IN THE VISIBLE REGION OF THE SPECTRUM AFTER EXCITATION BY UV LIGHT. THE AMTS. OF DNS AMINO ACIDS ON CHROMATOGRAMS MAY BE AS LOW AS 10 PRIME NEGATIVE11 TO 10 PRIME NEGATIVE10 MOLE. TO ILLUSTRATE THE POSSIBILITIES OF THE PRACTICAL APPLICATION OF THE APP., THE KINETICS OF SPLITTING OFF OF THE C TERMINAL AMINO ACIDS OF RNASE BY CARBOXYPEPTIDASE A WAS INVESTIGATED. THE DATA ARE IN AGREEMENT WITH THE AMINO ACID SEQUENCE IN RNASE. THUS, THE TECHNIQUE OPENS THE POSSIBILITY OF DETG. THE TERMINAL AMINO ACID SEQUENCES IN PROTEINS AND PEPTIDES ON AN ULTRAMICRO SCALE. FACILITY: INST. MOL. BIOL., MOSCOW, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--MASS SPECTROMETRIC STUDY OF THE THERMODYNAMIC PROPERTIES OF NAF AND MF SUB3 BINARY SYSTEMS (M IS SCANDIUM, YTTRIUM, LANTHANUM). I.

AUTHOR-(02)-SHCHEREDIN, V.P., SIDOROV, L.N.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(2), 514-17

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--MASS SPECTRUM, SODIUM COMPOUND, SCANDIUM COMPOUND, YTTRIUM COMPOUND, LANTHANUM COMPOUND, FLUORIDE COMPOUND

CONTROL MARKING--NO RESTRICTIONS.

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0455 STEP NO--UR/0076/70/044/002/0514/0517

CIRC ACCESSION NO--AP0104068

UNCLASSIFIED

2/3 014 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0104068

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING THE METHOD OF ISOTHERMAL EVAPN., MASS SPECTRA OF BINARY SYSTEMS OF NAF WITH SCF SUB3, YF SUB3 AND LAF SUB3 CONTG. 8 OR 45, 50, AND 50 MOLE PERCENT MF SUB3, RESP., WERE RECORDED AND INTERPRETED BY FINDING THE IONIC FLOW OF NA PRIME POSITIVE, NAF PRIME POSITIVE, NA SUB2 F PRIME POSITIVE, NA SUB3 F SUB2 PRIME POSITIVE, NAMF SUB3 PRIME POSITIVE, MF SUB2 PRIME POSITIVE, NAF, NA SUB2 F SUB2, NA SUB3 F SUB3, MF SUB3, AND NAMF SUB4 IN THESE SYSTEMS AT 1169 OR 1219, 1321, AND 1276DEGREESK, RESP. PARTIAL PRESSURES OF NAF, NA SUB2 F SUB2, NA SUB3 F SUB3, MF SUB4, AND NAMF SUB4 IN THE SYSTEMS ARE TABULATED.

UNCLASSIFIED

USSR UDC 666.1.056:678.84:678.643

SIL'VESTROVICH, S. I., STOLYAROV, M. I., GURIKOVA, L. M., STOLYAROVA, G. V., SHCHEREDINA, Ye. A., KOSHELKINA, O. N.

"Protective Effect of Polymer Coatings on Glass Surfaces"

Moscow, Steklo i Keramika, No 11, 1972, pp 12-15.

Abstract: The authors performed studies to determine the influence of protective organosilicon and other organic polymer coatings on industrial glass: sheet glass 1.5 mm thick and electric vacuum type S-49-2 glass (rods 5 mm in diameter). Coatings 1-25 μ thick were applied with the polymers in solution in toluene, acetone, ethyl alcohol, styrene and in a mixture of solvents. Polymers of this type reduce transparency only slightly in thin coatings, although aging may cause addition reductions in transparency. The polymer coatings tested approximately doubled the strength of the sheet glass surface, producing maximum effect with a coating thickness of 5-10 μ. Strong polymers and polymers with good adhesion to the glass produce the best effect. The protective effect is retained when the glass is exposed to high humidities for extended periods of time.

APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910019-5"

1/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--BEHAVIOUR OF NITROMETHANE AND NITROETHANE ON PLATINUM METALS -U-

AUTHOR-(02)-BOGDANOVSKY, G.A., SHCHEREV, G.I.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA, MAR, 1970, 6, (3), 318-322

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--NITROMETHANE, PLATINUM ELECTRODE, PALLADIUM, CHEMISORPTION, ETHANE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1987 STEP NO--UR/0364/70/006/003/0318/0322

CIRC ACCESSION NO--AP0125576

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0125576

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTERACTION OF NITROMETHANE AND NITROETHANE WITH THE SURFACE OF PT, PD, AND OTHER PT GROUP METALS WAS STUDIED, WITH SPECIAL REF. TO THE QUESTION OF THE ADSORPTION OF THE ORGANIC PARTICLES ON THE METAL SURFACE AND THE POTENTIAL DISPLACEMENT CORRESPONDING TO THIS EFFECT. THE BEHAVIOUR OF THE CHEMISORBED SUBSTANCES WAS ANALYSED BY PLOTTING POTENTIOSTATIC AND CHARGING CURVES. AFTER CONTACT WITH NITROETHANE IN PARTICULAR THE SURFACE OF A PT ELECTRODE REMAINED COVERED WITH CHEMISORBED PARTICLES OF VARIOUS COMPOSITIONS AFTER REPEATED WASHINGS. THE MECAHNISMS RESPONSIBLE FOR THESE EFFECTS ARE CONSIDERED.

UNCLASSIFIED

USSR

ROGOV, G. A., SHCHERS, A. L.

"Operative Control of Reserves of Products at Distributing Refrigeration Centers"

Teoriya i Praktika Sbora Peredachi i Obrabotki Ekon. Inform. [Theory and Practice of Collection, Transmission and Processing of Economic Information -- Collection of Works], Moscow, 1971, pp 93-103, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V476).

NO ABSTRACT.

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USSR

UDC 548.52

PORTNOY, K. I., GRIBKOV, V. N., SHCHETANOV, B. V., UMANTSEV, E. L., SILAYEV, V. A.

"On the Mechanism of Growth and Etching of Aluminum Nitride Whiskers"

Moscow, Kristallografiya, Vol 18, No 3, May/Jun 73, pp 599-604

Abstract: An investigation is made of the influence of iron impurities on the growth of aluminum nitride whiskers in the process of carbon reduction of aluminum oxide in a nitrogen atmosphere in accordance with the reaction $Al_2O_3 + 3C + N_2 = 2AlN + 3CO$. It is established that the presence of iron is a decisive factor in growth of the crystals. While it does not participate in the process of aluminum oxide reduction, the iron promotes whisker growth by the vapor - liquid - solid phase mechanism, acting as an aluminum and nitrogen solvent. It is shown that with insufficient aluminum in the gaseous phase, the reverse process of nitride whisker evaporation may take place by the solid phase - liquid - vapor mechanism with the iron acting as a solvent.

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USSR

UDC 548.522

ISAYKIN, A. S., GRIBKOV, V. N., SHCHETANOV, B. V., SILAYEV, V. A., and LEVINSKAYA, M. KH.

"Growth of Filamentary Aluminum Oxide Crystals During Reduction of Aluminum Oxide"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan/Feb 73, pp 112-119

Abstract: Thermodynamic analysis of aluminum oxide reduction by hydrogen and carbon showed that Al_2O produced the highest pressure among the gaseous reaction products and that Al_2O was primarily responsible for the mass transfer in the gaseous phase. A participation of aluminum vapors in this process was determined by the pressure of CO vapors within the reduction zone of alumina. Reduction of Al_2O_3 by C and H produced mainly Al_2O and Al, and the pressure of Al_2O was three times as high when the reduction was accomplished by carbon. A difference in temperatures between reduction and condensation zones of the order of 200-300°C produced a supersaturation equaling 10. Corundum whiskers were successfully grown in the presence of hydrogen when the difference in temperature between reduction and condensation zones was 60-80°C. A rapid growth of whiskers was observed at 2000-2050°C in the reduction zone when this temperature difference amounted to 150°C and the

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APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910019-5"

USSR

ISAYKIN, A. S., et al, Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan/Feb 73, pp 112-119

supersaturation was S≈5. The diameter of whiskers in this case was 10-30 μ and they were 20-25 mm long. When the difference in temperature between zones was 200-220°C, the whiskers were 1-10 μ in diameter and 8 mm long, but they had many defects. The whiskers were of irregular shape and very small when the temperature difference was 250-280°C. A condensation of aluminum droplets in the growing zone of whiskers led to the conclusion that the initial crystallization centers originated in these droplets and the growth of corundum whiskers in this process took place according to the vapor - liquid - solid phase mechanism.

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USSR

UDC 536.421/422/423:620./8

GRIBKOV, V. N., ISAYKIN, A. S., SHCHETANOV, B. V., UMANTSEVA, E. L., and MUKASEYEV, A. A., Moscow

"Vapor-Liquid-Solid Mechanism of Filamentary Crystal Growth of High-Melting Metals"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May/Jun 73, pp 62-67

Abstract: Growing SiC whiskers from $SiCl_4$ or $SiHCl_3$ at 1300-1500°C showed that whiskers are produced only in those cases when free silicon is condensed within the growth zone. If changes in temperature or in the composition of mixtures $SiCl_4:H_2$ or $SiHCl_3:H_2$ were such that the condensation of Si was prevented, whiskers were not produced. When temperature decreased below 1430°C (i.e., below the m.p. of Si) the whisker growth was terminated. Metal-like drops were observed at the top of all whiskers when the ratio of $F_{Si}-F'_{Si}/F_C - F'_C$ was sufficiently large (F and F' represent the concentration of atoms of corresponding elements in the gaseous phase and those evaporating from the liquid metal drop, respectively). X-ray diffraction analysis of these drops showed that they consisted of silicon. When the above ratio was optimal, whiskers up to 30 mm long and from 0.1 to 0.3 μm in diameter were grown. In the presence of aluminum, SiC whiskers were grown successfully at 1250-1600°C

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APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910019-5"

USSR

GRIBKOV, V. N., et al, Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May/Jun 73, pp 62-67

and were 20-30 mm long and 1-5μm in diameter. Droplets at the end of these whiskers consisted of Al-Si; in many cases the concentration of Al was 95-100%. The addition of Fe and Ni also intensified the growth of SiC whiskers. Droplets at the ends of these whiskers consisted of Fe-Si and Ni-Si. In the presence of these elements, whiskers were grown successfully at temperatures above 1350°C for nickel and 1400-1420°C for iron. In experiments with α-Al_2O_3 whiskers the necessary condition for growth was the presence of Si, SiO_2, or Fe_2O_3 in the reaction zone. Thus, aluminum, iron, and nickel can serve as additives for the growth of SiC whiskers. In the case of α-Al_2O_3 additives can be either silicon or iron.

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Aluminium and Its Alloys

USSR

UDC 548.522:546.621.21

GRIBKOV, V. N., ISAYKIN, A. S., UMANTSEV, E. L., and SHCHETANOV, B. V.

"Growth of α-Al_2O_3 Whiskers During Oxidation of Aluminum"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, No 7, 1972, pp 1249-1255

Abstract: Although the method of production of α-Al_2O_3 whiskers during oxidation of aluminum in moist hydrogen has been known for some time, a great deal remains unclear in the process. It has been assumed that mass transfer is conducted by the oxides Al_2O or AlO, formed by interaction of liquid aluminum with moisture. Later it was found that growth occurs only in mullite ceramic, containing SiO_2. It was therefore assumed that the aluminum is oxidized not by moisture, but by silicon monoxide. However, no experimental proof has been conducted. Therefore, this work studied the role of SiO_2 and its influence on growth, composition, and many other parameters. Whiskers were grown at 1,000-1,500°C in hydrogen with dew point between between 0 and - 55°C. Aluminum chips with purity 99.9999% were used. It was found that the growth of α-Al_2O_3 whiskers in the process of oxidation of aluminum in moist hydrogen, when grown in mullite ceramic, occurs by the mechanism vapor-liquid-solid phase by crystallization of aluminum oxide from liquid drops of alloys of aluminum with silicon and iron.

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USSR UDC 548.52

GRIBKOV, V. N., SILAYEV, V. A., SHCHETANOV, B. V., UMANTSEV, E. L., and ISAYKIN, A. S.

"Peculiarities of the Growth Mechanism of Silicon Nitride Whiskers"

Moscow, Kristallografiya, Vol 16, No 5, Sep-Oct 71, pp 982-985

Abstract: The authors studied the growth conditions and mechanism of α-Si_3N_4 whiskers grown by the reaction of silicon dioxide with silicon at 1350-1480° C in an atmosphere of nitrogen containing about 1 percent hydrogen, with special emphasis on the role of mullite. It was found that mullite is the best substrate for α-Si_3N_4. In the absence of mullite, whisker growth occurs only if iron or aluminum impurities are present in the initial charge or are introduced into the growth zone. Under these conditions deposition proceeds by a vapor-liquid-solid phase mechanism with the participation of drops consisting of aluminum-silicon, iron-silicon, or iron-aluminum-silicon alloys, while crystallization from the liquid phase proceeds by an axial screw dislocation mechanism.

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USSR

UDC 546.171.1'621

PORTNOY, K. I., GRIBKOV, V. N., ISAYKIN, A. S., SHCHETINKOV, B. V., and LEVINSKAYA, M. KH.

"The Role of Liquid Drops in the Growth of Aluminum Nitride Whiskers"

Moscow, Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 10, Oct 70, pp 1762-1767

Abstract: No theoretical or experimental proof has yet been obtained as to the possibility of the growth of refractory-compound whiskers by the "vapor-liquid-solid phase" mechanism, and there are contradictory views concerning the role of liquid drops in their growth. Therefore, the authors undertook to elucidate the need for the presence of liquid drops for the growth of refractory-compound whiskers, as well as to study the mechanism of their participation in such growth. Aluminum nitride whiskers were used for the study. The whiskers were grown by two methods, viz. (1) reduction of aluminum oxide in the presence of nitrogen and (2) nitriding of aluminum. Experiments showed that the growth of the AlN whiskers according to both reactions is always

USSR

PORTNOY, K. I., et al., Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 10, Oct 70, pp 1762-1767

accompanied by the formation of "drops." Electron diffraction and X-ray studies showed that the composition of the "drops" was identical to that of the whiskers, i. e.,they were spheres of aluminum nitride. Condensation of liquid aluminum drops is a necessary condition for the growth of AlN whiskers. It is unlikely that whiskers of AlN and other similar compounds grow by the "vapor-liquid-solid phase" mechanism. It is more probable that the aluminum drops are crystallization centers.

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1/2 052 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--NORMAL ELASTIC MODULUS OF CERAMIC WHISKERS -U-

AUTHOR-(03)-GRIBKOV, V.N., MUKASEYEV, A.A., SHCHETANOV, B.V.

COUNTRY OF INFO--USSR

SOURCE--PRORSHKOVAYA MET., MAR. 1970, (3), 84-88

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, METHODS AND EQUIPMENT, PHYSICS

TOPIC TAGS--SINGLE CRYSTAL, TEST METHOD, NONDESTRUCTIVE TEST, WHISKER CRYSTAL, CERAMIC, ULTRASONIC VELOCITY, ELASTIC MODULUS/(U)ALN CERAMIC WHISKER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/0625 STEP NO--UR/0226/70/000/003/0084/0088

CIRC ACCESSION NO--AP0134387

UNCLASSIFIED

2/2 052 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134387

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A METHOD OF DETERMINING THE NORMAL ELASTIC MODULUS OF CERAMIC WHISKERS (ALN AND OTHER ANALOGOUS MATERIALS) BY REF. TO THE VELOCITY OF LONGITUDINAL ULTRASONIC WAVES IN THEM IS DESCRIBED, AND SOME PRACTICAL EXAMPLES ARE PRESENTED. THE NORMAL ELASTIC MODULUS OF ALN WHISKERS SO DETERMINED EQUALS 30000-33000 KG-MM PRIME2, AS OPPOSED TO 35000 KG-MM PRIME2 IN A MASSIVE SINGLE CRYSTAL, MEASURED IN THE SAME CRYSTALLOGRAPHIC DIRECTION.

UNCLASSIFIED

USSR

UDC 621.791:669.293-669.295

SHCHETANOV, D. P., Engineer

"Welding of Niobium VN1 and VN2 Alloys With VT1 and OT4 Alloys"

Moscow, Svarochnoye Proizvodstvo, No 7, 1971, p 18-19

Abstract: The best protection for the liquid metal in the welding bath between dissimilar, chemically active metals and alloys is a deep vacuum. Therefore, welding of VN1 and VT1 was performed by the cathode ray method in a vacuum of 5.10^{-5} mm Hg. High-quality welded joints can be produced in all of the metals mentioned in the title as long as the running beam energy between the ends of the welded parts is precisely dosed to take into account the difference in melting points of the metals involved.

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USSR

UDC: 678.01:677.52+539.4

ZHIGACH, A. F., TSIRLIN, A. M., SHCHETILINA, YE. A., SVETLOV, I. L., GRIGOR'YEV, V. I., SHAFRANOVICH, E. G., BULYGINA, T. I., and YARTSEV, V. A., State Scientific-Research Institute of Chemistry and the Technology of Elementoorganic Compounds, Moscow

"Mechanical Properties of Boron Fibers"

Riga, Mekhanika Polimerov, No 4, Jul-Aug 73, pp 641-647

Abstract: The authors study the strength distribution of boron fibers. The study is based on a large amount of experimental material. The results show that the strength of boron fibers can be sufficiently accurately described by the Weibull or by normal rules of distribution. The parameters of these distributions are determined. The typical defects in boron fiber macrostructure are isolated and described. Mean strength as a function of tested fiber length is studied experimentally.

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1/2 033 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--DETERMINATION OF THE TUNGSTEN CONTENT IN THE BINDING PHASE OF HARD SINTERED ALLOYS -U-

AUTHOR-(05)-TUMANOV, V.I., SHCHETILINA, YE.A., CHEREDINOV, A.A., YELMAKOVA, S.M., SEREBROVA, O.I.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 262,483

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970, 47(6)

DATE PUBLISHED--26JAN70

SUBJECT AREAS--MATERIALS, CHEMISTRY

TOPIC TAGS--METAL CHEMICAL ANALYSIS, HARD ALLOY, TUNGSTEN CONTAINING ALLOY, MAGNETIC PERMEABILITY, CURIE TEMPERATURE, METALLURGIC RESEARCH FACILITY, FERROMAGNETISM, PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1463 STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0126994

UNCLASSIFIED

2/2 033 UNCLASSIFIED

CIRC ACCESSION NO--AA0126994 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE W CONTENT IS DETD. BY HEATING THE SAMPLE, MEASURING WITH A MAGNETOMETRIC APP. THE CHANGE OF THE MAGNETIC PERMEABILITY OF THE ALLOY, AND DETG. THE CURIE TEMP. ACCORDING TO THE LOSS OF FERROMAGNETIC PROPERTIES. FACILITY: VSESOYUZNYY NAUCHNO-ISSLEDOVATEL'SKIY INSTITUT TVERDYKH SPLAVOV.

UNCLASSIFIED

USSR

UDC 535.215.1

SHCHETININ, M.P.

"Effect Of Polarization Of Radiation On Photoconductivity Of Indium Antimonide"

Tr.Gos.optich. in-ta (Works Of State Optical Institute), 1972, 40, No 171, p 46 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 1972, Abstract No 9B276)

Translation: The photoconductivity is investigated of oriented p-type indium antimonide with a concentration of equilibrium carriers $p = 3.10.10^{15}$ cm^{-3} [sic], and a resistivity $\rho = 590$ ohm .cm in polarized light in the 4.0--6.0 micron region of the spectrum at the temperature of liquid nitrogen. It is observed that the photoconductivity depends on the relative orientation of the electrical vectors of the incident wave and the bias field applied in a determined crystallographic direction. The most difference in photoresponse is observed with parallel and perpendicular orientation of the vectors of the incident wave and the bias field. Annotation.

1/1

USSR UDC 622.011.43

SHCHETININ, V. V.

"Experimental Studies of Stressed Anchor Members for Reinforcement of Rock Masses"

Tezisy Dokl. i Soobshch. na 2-i Nauch.-tekhn. Konf. "Gidroproyekta", Moskva, 1972, Ch. I [Abstracts of Reports at Second Scientific and Technical Conference of "Gidroproyekt," Moscow, 1972, Part 1 -- Collection of Works], Moscow, 1972, pp 45-47, (Translated from Referativnyy Zhurnal, Mekhanika, No 11, 1972, Abstract No 11 V765 by V. E. Darevskiy).

Translation: It is noted that stressed anchoring can achieve the necessary stability of potentially unstable rock masses. Experimental studies were performed in an experimental sector of the Toktogul'skaya Hydroelectric Power Plant to develop designs and technologies for placement of deep stressed rigid rod and flexible anchor members for forces of 50-100 and 120 t respectively. The flexible members of high strength wire and cable are considered most desirable. It is found that preliminary stress losses in them occur during the first days, and that periodic tightening can achieve constant tension until the stresses in the members stabilize. Results of the studies were used as a basis for a plan for stabilization of an unstable rock mass

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USSR

UDC 622.011.43

SHCHETININ, V. V., Tezisy Dokl. i Soobshch. na 2-i Nauch.-tekhn. Konf. "Gidrorpoyekta," Moskva, 1972, Ch. I, Moscow, 1972, pp 45-47.

with a volume of 14,000 cubic meters on the slope of the Naryn River Canyon. An additional holding force of 2,100 t is to be created using 18 members prestressed at 100 and 167 t, placed to depths of 25-30 m.

2/2

USSR

ILLARIONOVA, O. S., and SHCHETININ, V. V., Vladivostok Medical Institute

"Dynamics of Morphological and Histochemical Changes in the Myocardium After Exposure to Ultrasound"

Vladivostok, Biologicheskiye i Meditsinskiye Issledovaniya na Dal'nem Vostoke (Biological and Medical Research in the Far East), Vladivostok, 1971, pp 135-137

Abstract: The thickness of the myocardial wall can be safely determined by means of ultrasound during open-heart surgery provided that the exposure is for no more than 5 minutes. Experiments with ultrasonication of dog myocardium for up to 5 minutes showed no apparent morphological or histochemical changes. However, one hour after 10 to 15 minutes of exposure the cytoplasm of the cells stained unevenly with eosin and there were signs of hyperemia and stasis in the blood vessels. The color of the glycogen lumps was dull. Exposure of the myocardium to ultrasound for 15 minutes or more resulted in hyperemia and stasis in the blood vessels, edema of the stroma, appearance of cellular infiltrates around the blood vessels, and some areas lacking in glycogen.

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1/2 · 026 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--MECHANIZATION OF THE WELDING OF CORNER JOINTS OF STEELS OF DIFFERENT THICKNESS -U-

AUTHOR--SHCHETININA, V.I., PSARAS, G.G.

COUNTRY OF INFO--USSR

SOURCE--SVAR. PROIZVOD. 1970, (1), 38-9

DATE PUBLISHED--------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--STEEL WELDING, WELD JOINT POROSITY, WELD EVALUATION, NICKEL STEEL, AUTOMATIC WELDING, TITANIUM STEEL, WELDING FLUX, WELDING ELECTRODE/(U)KH18N10T STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1377 STEP NO--UR/0135/70/000/001/0038/0039

CIRC ACCESSION NO--AP0107850

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107850

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONDITIONS OF WELDING WERE DETD. OF ANGLE SEAMS OF STEEL KH18N10T FORMED BETWEEN BANDS 150-600 IN SIZE AND 2-5 MM THICK, AS WELL AS BANDS 2-50 MM THICK. D.C., WELDING WIRE SV-06KH19N9T DIAM. 1.5-3 MM, AND FLUX AN-26 WERE USED. THE QUALITY OF THE WELDED JOINT DEPENDED MAINLY ON WELDING CONDITIONS, POSITION OF WELDED SPECIMENS AGAINST THE WELDING WIRE, AND THE GRANULATION OF THE FLUX. THE FORMATION OF PORES COULD BE AVOIDED, WHEN THE ANGLE OF THE CLEARANCE WAS 90-180DEGREES AND THE RATIO OF THE THICKNESSES OF THE WELDED BANDS WAS 0.1-1.0. A NOMOGRAM WAS DESIGNED TO SHOW OPTIMAL WELDING CONDITIONS DEPENDING ON THE THICKNESS, DIAM. OF THE WELDING WIRE, AND THE ANGLE OF THE CLEARANCE. THE OPTIMAL WELDING RATE WAS 30-40 M-HR AND THE ARC POTENTIAL WAS 30-40 V. WELDED JOINT WERE RESISTANT TO INTERCRYST. CORROSION AND FREE OF DEFECTS AND PORES, AND CONTAINED 5-7PERCENT FERRITE PHASE.

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1/2 012 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--AUTOMATIC DEVICES FOR THE CONTINUOUS MEASUREMENT OF THE CONCENTRATION OF LIQUID MEDIA -U-

AUTHOR-(02)-SHCHETINSKIY, V.V., KOVANKO, M.M.

COUNTRY OF INFO--USSR

SOURCE--BUM. PROM. 1970, (2) 23

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--AUTOMATIC CONTROL SYSTEM, QUANTITATIVE ANALYSIS, CARBONATE, SULFITE, SULFATE, POTENTIOMETRIC TITRATION, BARIUM CHLORIDE/(U)KAD CHEMICAL ANALYZER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1373 STEP NO--UR/0329/70/000/002/0023/0023

CIRC ACCESSION NO--AP0107846

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107846

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN EXPTL. MODEL OF THE KA-D ANALYZER FOR QUANT. DETN. OF ACTIVE ALKALI AND SULFIDITY IN WHITE LIQUORS HAS BEEN CONSTRUCTED. THE AUTOMATIC DETNS. ARE IN 2 STAGES: THE REMOVAL FROM THE SAMPLE OF INACTIVE ALKALI (NA CARBONATE, SULFITE, AND SULFATE) BY TREATMENT WITH A DETD. AMT. OF BACL SUB2, AND POTENTIOMETRIC TITRN. OF AN ALIQUOT PORTION OF THE SUPERNATANT WITH HCL. THE TITRN. CURVE HAS 2 INFLECTION POINTS: (1) THE END POINT OF THE REACTION NAOH PLUS NA SUB2 S PLUS HCL YIELDS 2NACL PLUS H SUB2 O PLUS NAHS; (2) THE END POINT OF THE REACTION NAHS PLUS HCL YIELDS NACL PLUS H SUB2 S. WHITE LIQUOR (3 ML) AND BACL SUB2 SOLN. ARE INTRODUCED BY MEMBRANE METERING DEVICES, INTO THE FIRST REACTOR, WHERE THE PPT. SEDIMENTS. SIMULTANEOUSLY, WATER IS INTRODUCED. ANOTHER METERING DEVICE TRANSFERS AN ACCURATELY MEASURED AMT. OF THE SUPERNATANT TO THE TITRN. VESSEL, WHERE HCL IS DELIVERED FROM AN AUTOMATIC BURETTE. A METAL OXIDE INDICATOR ELECTRODE AND A CALOMEL ELECTRODE ARE USED; THE 2 END POINTS ARE RECORDED, GIVING THE AMT. OF NAOH AND NA SUB2 S, RESP. (THE READINGS ARE MADE IN G-L. NA SUB2 O). THE REPRODUCIBILITY OF THE ANAL. IS PLUS OR MINUS 1-1.5PERCENT; DETN. TIME IS SIMILIAR TO 7 MIN. SIMILAR INSTRUMENTS FOR THE VOLUMETRIC ANAL. OF OTHER INDUSTRIAL LIQS. CAN BE DESIGNED ON THE SAME PRINCIPLE. AFTER PRELIMINARY TESTS, THE KA-D APP. IS BEING USED IN MILLS ON AN EXPTL. BASIS.

UNCLASSIFIED

USSR

UDC 539.234+539.26+621.416

GRIGOR'YEV, O. N., KLOCHKOV, V. P., KOSENKO, V. YE., STADNIK, A. V., SHCHETKIN, V. N.

"Obtaining and Studying Monocrystalline Films of Silicon on Sapphire and Metal-Oxide-Semiconductor Transistors Based on Them"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No 6, 1971, pp 16-23

Abstract: A study was made of the effect of the degree of perfection of sapphire substrates on the perfection of the silicon films, the mechanism of formation of a large number of defects in films and the effect of structural defects of the films on the primary parameters of instruments manufactured on the basis of them. Sublimation in a vacuum was used to obtain monocrystalline films of silicon on sapphire and silicon on silicon. The substrates and films were investigated by the methods of x-ray diffraction microscopy. Metal-oxide-semiconductor transisters with characteristics not inferior to the characteristics of analogous instruments made of massive silicon were manufactured from silicon films on sapphire. Topograms of the α-Al_2O_3 substrate of $10\bar{1}2$ orientation taken by various methods are presented. A procedure for obtaining the films is described by which it is possible to obtain silicon films on sapphire which with respect to structure and properties are not inferior to the best films obtained by the method of thermal decomposition of silane or reduction of silicon halides. There are a large number of defects in the silicon films

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GOR'YEV, O. N., et al., Poluprovodnikovaya tekhnika i mikroelektronika, No 6, 71, pp 16-23

on sapphire the mechanism of occurrence of which is not fully explained and obviously is of a theoretical nature. The volt-ampere characteristics of the metal-oxide-semiconductor transistors manufactured by the proposed procedure are presented and discussed. The maximum transconductance of transistors with a channel width of 100 microns was 300 micromhos and varied within the limits of 200-300 micromhos. For transistors with a channel width of 400 microns, the transconductance is within the limits of 800-1,000 micromhos.

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USSR UDC 539.234+539.26+621.416

GRIGOR'YEV, O. N., KLOCHKOV, V. P., KOSENKO, V. Ye., STADNIK, A. V., and SHCHETKIN, V. N.

"Preparing and Investigating Monocrystalline Silicon Films on Sapphire and MOS Transistors of That Type"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 6, 1971, pp 16-25

Abstract: As opposed to silicon films deposited on silicon, these films on sapphire permit substantial reductions in the parasitic capacitance of integrated circuits and have other benefits. This paper discusses some problems arising in connection with these devices, such as the effect of the state of the sapphire substrate on the silicon film, the mechanism for the formation of film defects, and the effect of such structural defects on the basic parameters of transistors made by this process. The specimens used in the experiments of the present paper were of the silicon on silicon and the silicon on sapphire type, with the deposition made in vacuum heating chambers of stainless steel. In one type of specimen the films were sputtered on the substrate in a vacuum of 1-3·